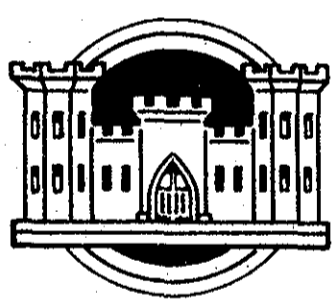


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# ANNISQUAM RIVER

MASSACHUSETTS  
PRELIMINARY  
EXAMINATION  
REVIEW OF REPORTS



NEW ENGLAND DIVISION  
CORPS OF ENGINEERS  
DEPARTMENT OF THE ARMY  
BOSTON, MASS., 12 MARCH 1948

Retained 5-6-8

Destroyer. 5-11-13-14

WAR DEPARTMENT  
CORPS OF ENGINEERS  
OFFICE OF DIVISION ENGINEER  
NEW ENGLAND DIVISION  
31 ST. JAMES AVENUE  
BOSTON 16, MASS.

ADDRESS REPLY TO:  
THE DIVISION ENGINEER

REFER TO FILE NO.

12 March 1948

SUBJECT: Estimate in Connection with Preliminary Examination on Annisquam River, Massachusetts.

TO: The Chief of Engineers  
Department of the Army  
Washington 25, D. C.

1. There is being submitted this date a favorable preliminary examination report on Annisquam River, Massachusetts, with a view to widening and deepening the channel in Annisquam River.

2. The estimates given below are based on best available data and indicate the approximate cost, on present price levels, of widening the existing channel to 200 feet throughout its length and increasing the depth from 8 feet to 14 feet at mean low water, as desired by local interests. The estimated quantity of material shown is in terms of place measurement and includes an allowance for one foot of allowable overdepth dredging. There is included in the estimate an allowance for engineering and contingencies.

<u>Estimated Quantities</u>	<u>Estimated Cost</u>
Dredging 1,100,000 cubic yards at \$.60 . . . .	\$ 660,000
Sand catcher, piling and stone . . . . .	300,000
Reconstruction of railroad bridge. . . . .	300,000
Reconstruction of Blynman Bridge . . . . .	<u>400,000</u>
	\$1,660,000

3. The estimated annual carrying charges for the desired improvement would be \$70,000. The annual benefits are those resulting from lower transportation costs in transporting fuel and other products, in savings through eliminating delays and losses to the fishing fleet, in providing a more sheltered and somewhat safer route for smaller vessels, in providing a harbor of refuge, and through its increased value in the intracoastal waterway system. The aggregate of these benefits are considered to be sufficient to offset the annual carrying charges.

4. It is believed that study of the project may reveal that a somewhat smaller channel than that suggested by local interests would

be satisfactory to them and adequate for present and prospective commerce. If the channel depth can be increased to 10 or 12 feet and no changes made in the existing bridges, the costs would be materially reduced and the ratio of expected benefits to the annual carrying charges would be greatly increased.

5. A hydrographic survey of the area, together with necessary soundings, would require about eight weeks to complete. In this connection, it is pointed out that maintenance surveys to be made this spring will materially reduce the field work required for the report. The cost of the survey and the report is estimated to be approximately \$8,000.

R. G. MOSES  
Brigadier General, U.S.A.  
Division Engineer

NOT FOR PUBLIC RELEASE

DEPARTMENT OF THE ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION  
BOSTON, MASS.

12 March 1948

SUBJECT: Preliminary Examination (Review of Reports) of Annisquam River, Massachusetts.

TO: The Chief of Engineers, Department of the Army, Washington 25, D. C.

SYLLABUS

The Division Engineer finds that the further improvement of the Annisquam River to meet the requirements of commercial and recreational traffic may be justified and accordingly recommends a survey to determine the cost of the improvement desired by local interests and the extent and cost of the improvements that may be found justified and the proper basis of local cooperation.

AUTHORITY

1. This report is submitted in compliance with the following resolution, adopted 22 April 1947, by the Committee on Public Works of the House of Representatives, United States:

RESOLVED BY THE COMMITTEE ON PUBLIC WORKS OF THE HOUSE OF REPRESENTATIVES, UNITED STATES, That the Board of Engineers for Rivers and Harbors be, and is hereby, requested to review the reports on Annisquam River, Massachusetts, printed in House Document Numbered 329, Seventy-seventh Congress, 1st Session, and previous reports, with a view to determining if it is advisable to modify the existing project in any way at this time.

2. The report under review was adopted by the River and Harbor Act of 2 March 1945 and was printed in House Document Numbered 329, Seventy-seventh Congress, 1st Session. This report was favorable to further improvement of Annisquam River to the extent of providing a dredged anchorage area about 17 acres in extent and 8 feet deep at the entrance to Lobster Cove, at an estimated first cost of \$70,000, with \$2,200 annually for maintenance in addition to that then required. This report was made in review of the report on Gloucester Harbor and Annisquam River, Massachusetts submitted in River and Harbor Committee

Document No. 39, Seventy-second Congress, 1st Session, which provided for a channel in Annisquam River 8 feet deep at mean low water, 60 feet wide from Gloucester Harbor to the Boston & Maine Railroad bridge, 100 feet wide from the railroad bridge to the mouth of the river, and 200 feet wide across the bar in Ipswich Bay, including the removal of a ledge near the Gloucester Harbor entrance, at a total estimated cost of \$32,500, with maintenance estimated at \$3,500 annually.

#### DESCRIPTION

3. Annisquam River is a tidal waterway extending from Gloucester Harbor to Ipswich Bay, a distance of approximately 4 miles. In its original condition, depths in the Annisquam River did not exceed about 6 feet at mean low water and from the Boston & Maine Railroad bridge to Gloucester Harbor the stream consisted of little more than a drainage ditch with a bottom elevation of 0 to 2 feet at mean low water. A portion of this section, extending about 1,800 feet from the harbor entrance, is known as the Blynman Canal. Improvements by the Commonwealth of Massachusetts beginning in 1903, and by the Federal Government beginning in 1936, have provided a depth of 8 feet in the entire waterway, and widths ranging from 60 to 200 feet. The mean and spring ranges of tide at the Gloucester Harbor entrance to the river are 8.7 feet and 10.1 feet, respectively. At Annisquam, near the mouth of the river, the mean and spring ranges of tide are 8.5 feet and 9.9 feet, respectively.

4. The locality is shown on United States Coast and Geodetic Survey Charts Nos. 233 and 243 and on the map accompanying this report.

#### TRIBUTARY AREA

5. The City of Gloucester, located at the southern end of the waterway, constitutes the principal commercial area tributary to the harbor. Its leading industries are fishing and related industries and manufacturing. During 1947 Gloucester was exceeded only by the port of Boston in the amount of fish received. Gloucester had a population of 24,862 in 1945 and real estate with an assessed valuation of \$39,620,271.

6. In addition to the commercial activity in Gloucester, the entire Cape Ann area constitutes a well-established recreational area. Each season the normal population of the area is greatly augmented by summer residents attracted by the facilities for water sports, the natural beauty and the comfortable climate which are afforded in this locality. Tuna fishing in Ipswich Bay is one of the features which is growing in importance as an attraction to sport-fishing enthusiasts. To the permanent residents of Cape Ann, this recreational trade forms one of its leading sources of income. The locality is served by the eastern division of the Boston & Maine Railroad and by a network of improved roads and highways.

#### BRIDGES

7. The Annisquam River is crossed by one highway and one railroad bridge authorized by State law 4 April 1905 and 26 March 1845, respectively. A second highway bridge located about 2.9 miles above the mouth at Gloucester and authorized by the Secretary of War 13 April 1944 is now under construction by the Massachusetts Department of Public Works. This bridge will have a fixed opening for a channel leaving a width of 146 feet, a least vertical clearance of 65 feet at mean high water and 73.9 feet at mean low water. The present highway bridge, which is owned by Essex County, crosses the Blynman Canal at a point not more than 200 feet from the Gloucester Harbor end of the waterway. This structure includes a double-leaf bascule span which provides a navigable horizontal clearance of 40 feet and vertical clearances of 16.4 feet at mean low water and 7.5 feet at high water. Plans for this structure were approved by the War Department 12 August 1913 as construction was completed in October 1913. The railroad bridge, owned by the Boston & Maine Railroad, crosses Annisquam River about 4,000 feet from Gloucester Harbor. This bridge includes a single-leaf bascule span which provides a horizontal clearance of 40 feet and vertical clearances of 25.5 feet at mean low water and 16.6 at high water.

#### PRIOR REPORTS

8. With the exception of the reports described in Paragraph 2, there have been no reports made on this waterway in recent years.

#### EXISTING PROJECT

9. No improvements were made by the United States prior to the adoption of the existing project for Annisquam River. The existing project was authorized by the River and Harbor Act of 30 August 1935, and supplemented by an enactment of 2 March 1945. It provides for a channel 8 feet deep, 60 feet wide from Gloucester Harbor to the Boston & Maine Railroad bridge, 100 feet wide from the railroad bridge to the mouth of the river, and 200 feet wide across the bar in Ipswich Bay, including the removal of a ledge near the Gloucester Harbor entrance; and dredging an anchorage area about 17 acres in extent and 8 feet deep at the entrance of Lobster Cove.

10. The existing project, with the exception of the Lobster Cove anchorage, was completed in 1936 at a cost of \$33,975.89. In 1940 maintenance dredging to restore project depths and ease bends was carried on at a total cost of \$57,679.62, since which time no maintenance has been done although some is now necessary and is proposed for the near future. The present approved annual maintenance cost is \$5,700.

#### LOCAL COOPERATION

11. There were no prescribed conditions of local cooperation for the Annisquam River channel improvement. The Lobster Cove anchorage improvement provides that local interests contribute one-third of the initial cost of the improvement, but not to exceed \$25,000, furnish free of cost to the United States all lands, easements, rights-of-way and spoil disposal areas necessary for the improvement and subsequent maintenance, when and as required, and hold and save the United States free from all claims for damages resulting from the improvement. Local interests are prepared to meet these requirements at any time.

#### OTHER IMPROVEMENTS

12. The Commonwealth of Massachusetts began the improvement of the Annisquam River in 1903 and continued work through 1930. During this period the channel was dredged and improved until a channel 8 feet deep was secured and the banks of the Blynman Canal riprapped. There was expended \$171,498.69 for this work. It also improved Lobster Cove by dredging a channel 6 feet deep and anchorage basins 6 and 8 feet deep at mean low water at a cost of \$66,916.68. A channel and small basin in Mill River, a tributary to the Annisquam, was also dredged by the Commonwealth to a depth of 6 feet at a cost of \$24,899.59. The total spent by the Commonwealth of Massachusetts to date on Annisquam River and its tributaries is \$263,314.96. These expenditures include contributed funds by local interests.

#### TERMINAL AND TRANSFER FACILITIES

13. There are two commercial wharves on Annisquam River equipped for receipt, storage and shipment of petroleum products. Recently only one has been so used. They are located on the east bank, one immediately north of the Boston & Maine Railroad bridge, the other immediately south. Facilities for pleasure craft include the landing of the Annisquam Yacht Club and several small private landings along the river and in Lobster Cove.

#### IMPROVEMENT DESIRED

14. In order to obtain the views of interested parties concerning the improvements desired, a public hearing was held at Gloucester, Massachusetts on 27 January 1948. There were present at the hearing representatives of the State and municipal governments and representatives of the Maritime Association of Boston Chamber of Commerce, Gloucester Chamber of Commerce, U. S. Power Squadron, Gloucester Power Squadron, American Power Boat Association, Annisquam Yacht Club and several business concerns.

15. The improvement desired by the proponents is the deepening of the Annisquam River from 8 feet at mean low water to 14 feet and widening

the channel to a width of 200 feet or as near such width as may be found practicable. This improvement was suggested by the manager of the Maritime Association of the Boston Chamber of Commerce who pointed out that the Annisquam River is a logical and important extension of the intra-coastal waterway north of Boston, that the large number of vessels using it indicates that its value is greater than merely local in character and that the desired improvement would enable much larger vessels to use it and thus avoid the hazardous outside route around Cape Ann.

16. The Boston Fuel Transportation, Inc. presented a statement in favor of the proposed improvement. This company is engaged in the transportation of petroleum products in small self-propelled diesel tankers. These vessels draw about 12 feet loaded and under present conditions of the channel do not use the river. Hence, during bad weather conditions around Cape Ann they are forced to put into Gloucester Harbor. If they could transit the river they would proceed along a more sheltered course to Portsmouth or Portland without delay. The savings thus secured would ultimately be passed on to the consumer.

17. A representative of the 12th District of the United States Power Squadron spoke in favor of the improvement. He also acted as representative of the Mayor of Newburyport, the Selectmen of Salisbury, the boat owners of Seabrook and Hampton and the harbor master of Newburyport and Salisbury, all of whom wished to be recorded in favor of the dredging. It was pointed out that this improvement was necessary in connection with the Inland Waterway from the Annisquam to the Merrimack upon which a study and survey have been ordered.

18. A representative of the Propeller Club of the United States appeared at the hearing and spoke in favor of the modification.

19. The Commissioner of the Department of Public Works, Commonwealth of Massachusetts submitted a communication in which it was stated that his Department was not ready to take a definite stand on the improvement. His principal concern was the probable requirement that the Blynman Bridge

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would have to be replaced. He felt that if this cost was to be borne by the Commonwealth that funds would not be available and that his Department would be constrained to disapprove the project.

20. The desired improvement would require that new bridges be constructed to replace both the existing highway bridge over the Blynman Canal and the railroad bridge.

#### COMMERCE

21. The following table gives a comparative statement of the traffic through Annisquam River for the ten year period 1937 through 1946.

Comparative Statement of Traffic, 1937 - 1946

<u>Year</u>	<u>Tons</u>	<u>Year</u>	<u>Tons</u>
1937	8686	1942	8246
1938	9267	1943	2446
1939	7387	1944	2332
1940	7619	1945	3625
1941	8949	1946	4062

22. The above traffic was entirely made up of petroleum products. In addition, cargoes of fish pass through the river of which no accurate records are available. One of the companies formerly receiving oil at its wharf on the river no longer does so, which accounts for the decreased tonnage shown for 1946 as compared with 1942 and prior years.

#### VESSEL TRAFFIC

23. During 1946 a total of 6,429 vessels passed through the river, requiring 5,158 openings of the draw in Blynman Bridge. These vessels consisted of 33 steamers, 20 sailing vessels (yachts), 6,220 motor vessels and 156 vessels in tow. The bridge operators estimated that as many more vessels use the river that do not require draw opening, and of which no record is kept.

24. The 6,220 motorboats include a large number of fishing vessels using the river in passing to and from Gloucester Harbor to fishing grounds in Ipswich Bay and beyond. Their loaded draft is from 3 to 12 feet with the movement of the larger vessels being restricted to fulltide periods.

### DIFFICULTIES ATTENDING NAVIGATION

25. The principal difficulties attending navigation are concerned with the tendency toward shoaling in the present channel and across the bar at the Ipswich Bay entrance. No maintenance dredging has been done since 1940 and recent reports that are being investigated indicate that the present controlling depth is 5 feet or less at mean low water. Consequently, fishing vessels comprising a large percentage of the traffic can only transit the river at high water and then only with difficulty. In addition, the alignment of the channel and the bridge clearance serve to render navigation difficult. The proposed improvement would eliminate these difficulties.

### WATER POWER AND OTHER SPECIAL SUBJECTS

26. There are no questions of water power or flood control pertinent to this report.

### SHORELINE CHANGES

27. The structures that would probably be required to be constructed to prevent the channel across the bar at the Ipswich Bay entrance from shoaling unduly would undoubtedly act as sand catchers. In view of the sandy nature of the territory, especially to the west, there appears little doubt that shoreline changes may occur.

### DISCUSSION

28. The Annisquam River became a Federal project in 1935 when the 8-foot project was adopted. Previously the Commonwealth of Massachusetts had dredged and maintained the channel.

29. The channel enables small vessels to avoid the passage around Cape Ann. The conditions on the outside passage at Cape Ann are frequently stormy and often are such as to render it impossible for small vessels to navigate it safely. At such periods small vessels bound north can seek shelter in Gloucester Harbor or can proceed through the Annisquam River to its northern entrance to await favorable conditions for crossing the bar into Ipswich Bay. This crossing is difficult and unsafe for recreational

the Annisquam must be made in connection with the inland waterway in order that it be continuous for that depth. Since the Annisquam River might be found economically justified for further improvement while the inland waterway might not be, it is not believed that the survey of the Annisquam River should be combined with that for the inland waterway, but should be made separately.

#### CONCLUSION

35. The Division Engineer finds that further improvement of the Annisquam River to meet the requirements of commercial and recreational traffic may be justified, and a survey is warranted to determine more definitely the best plan of improvement and its justification.

#### RECOMMENDATION

36. In view of the above, the Division Engineer recommends a survey, with necessary probings, be made of the Annisquam River to determine the cost of the improvement desired by local interests, and the extent and cost of the improvements which may be found justified and the proper basis of local cooperation.

R. G. MOSES  
Brigadier General, U.S.A.  
Division Engineer

Inclosure:  
Plate No. 1

